

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY



To:

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PCT
NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT
(PCT Rule 71.1)

Date of mailing
(day/month/year) 30.07.2004

Applicant's or agent's file reference
XA1540

IMPORTANT NOTIFICATION

International application No.
PCT/GB 03/02746

International filing date (day/month/year)
27.06.2003

Priority date (day/month/year)
09.07.2002

Applicant
BAE SYSTEMS PLC ET AL.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international preliminary examining authority:



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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)

Applicant's or agent's file reference XA1540		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/GB 03/02746	International filing date (day/month/year) 27.06.2003	Priority date (day/month/year) 09.07.2002	
International Patent Classification (IPC) or both national classification and IPC G01S13/26			
Applicant BAE SYSTEMS PLC ET AL.			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 8 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the opinion</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input checked="" type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>			
Date of submission of the demand 28.01.2004		Date of completion of this report 30.07.2004	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer van Norel, J Telephone No. +49 89 2399-2181 	

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB 03/02746

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-12 as published

Claims, Numbers

1-22 as published

Drawings, Sheets

1/6-6/6 as published

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 21,22

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 21,22 are so unclear that no meaningful opinion could be formed (*specify*):

see separate sheet

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos.

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the Standard.

☐ the computer readable form has not been furnished or does not comply with the Standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	3,5,10,13,16,19,20
	No: Claims	1,2,4,6-9,11,12,14,15,17,18
Inventive step (IS)	Yes: Claims	3,5,10,13,16
	No: Claims	1,2,4,6-9,11,12,14,15,17-20
Industrial applicability (IA)	Yes: Claims	1-20
	No: Claims	

2. Citations and explanations

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see separate sheet

1. **Section III:**

No opinion about the novelty, inventive step and industrial applicability of the subject-matter of **claims 21 and 22** is provided here.

References as "with reference to Figures 3 to 6" and "with reference to the accompanying drawings" are not allowable, according to Rule 6.2(a) PCT.

It would be appropriate to remove claims 21 and 22.

2. **Section V:**

Reference is made to the following documents; the numbering will be adhered to in the rest of the procedure:

D1 = EP-A-0291337

3. The subject-matter of claims 1 and 6 is not new (Article 33 (2) PCT).

3.1 **Claim 6:**

D1 discloses a radar system (see D1, Figures 1, 8 and 9) comprising:

- means (1,2,4) for generating a radar pulse;
 - means (3,5,6,9,31) for modulating the radar pulse (in D1, the radar pulses are phase-modulated *from pulse-to-pulse*, as further set out below);
 - means (10,11,12) for transmitting the radar pulse;
 - means (11,12,13) for receiving a reflected radar pulse;
 - means (5,6,9,14,31) for modulating the received radar pulse; and
 - means (1,15,16,40,41,42) for processing the modulated received radar pulse to obtain range information (see D1, Col. 11, Lines 5-6); and
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- whereby the means for modulating the radar pulse includes a phase shifter (6,9,31) which applies a time-dependent phase shift, which is changed at discrete time intervals (see D1, Col. 3, Lines 56-63 and Fig. 3; thus more specifically, D1 discloses a phase shifter which applies a time-dependent phase shift, which is changed at discrete time intervals *from pulse-to-pulse*, which features read on to claim 6; furthermore, the Applicants' attention are drawn to the fact that it is **nowhere** mentioned explicitly in the present application that multiple phase changes are made *within each pulse*), at substantially the radar transmission frequency (i.e. at the local oscillator frequency in D1, which is *substantially* at the radar transmission frequency, which is commonly known in the art), and
 - the means for modulating the received radar pulse includes a phase shifter

- (6,9,31) which applies a time-dependent phase shift, which is changed at discrete intervals, at substantially the radar transmission frequency; and
- the means for processing the modulated received radar pulse includes sampling means (40) for sampling the received signal at discrete time intervals which are an integral number of the time intervals of the time-dependent phase shift (the latter feature is commonly known in the art, and implicitly disclosed in D1).

Hence, D1 discloses a radar system having all the features of present claim 6.

3.2 Claim 1:

The features of method claim 1 correspond to the features of apparatus claim 6.

The feature of "obtaining high range resolution in a radar system" is defined in terms of a result to be achieved and is **not** a distinctive technical feature which would limit the scope of claim 1 (cf. the PCT Guidelines, III-4.7). Moreover, the method disclosed in D1 is also for "obtaining high range resolution in a radar system", since D1 discloses a method for improving the capability of detecting a target in a radar system by removing range ambiguity (e.g. see D1, Col. 1, Line 11, and Lines 47-50).

Thus, the subject-matter of claim 1 is not new.

4. In addition to the above, D1 anticipates the subject-matter of the following claims of the present application:

4.1 Claims 2 and 7:

Each phase shifter is driven in accordance with a synthesised sequence (see D1, Col. 3, Lines 62-63).

4.2 Claim 4:

The time-dependent phase shift produces a predetermined phase profile (see D1, Col. 6, Lines 15-25).

4.3 Claims 8 and 9:

It is considered as trivial features to implement the synthesised sequence by a plurality of discrete logic components or a FPGA.

4.4 Claims 11 and 12:

The means for modulating the radar pulse includes a local oscillator (5) and first mixing means (3), the local oscillator providing a signal for mixing with the radar pulse in the first mixing means. The local oscillator signal is phase shifted prior to mixing with the radar pulse (see D1, Figures 1 and 8).

4.5 Claims 14 and 15:

The means for modulating the received radar pulse includes a local oscillator (5) and second mixing means (14), the local oscillator providing a signal for mixing with the received radar pulse in the second mixing means. The local oscillator signal is phase shifted prior to mixing with the received radar pulse (see D1, Figures 1 and 8).

4.6 Claims 17 and 18:

A single local oscillator (5) is utilised which provides a local oscillator signal to both the radar pulse and the received radar pulse. A single phase shifter (6,9) is utilised for both modulation of the radar pulse and modulation of the received radar pulse (see D1, Figure 1).

5. Dependent **claims 19 and 20** do not appear to contain any additional features which, in combination with the features of any claim to which they refer, involve an inventive step.

Digital phase shifters and comprising monolithic microwave integrated circuits are commonly known in the art. Including such phase shifters in the system disclosed in D1 would be an entirely self-evident approach for the skilled person.

6. **Notwithstanding the above objections, it appears that the features of dependent claims 3, 5, 10, 13 and 16 are new and involve an inventive step.**

7. Should the application enter the regional phase, then the following matters also require attention:

- 7.1 reference signs in parentheses should be inserted in the claims (Rule 6.2(b) PCT). This applies to both the preamble and characterising portion.
- 7.2 the opening pages of the description should be brought into line with the new claims.
- 7.3 document D1 should be referred to in appropriate terms in the description to

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International application No. PCT/GB 03/02746

- comply with Rule 5.1(a)(ii) PCT.
- 7.4 as a precaution, care should be taken to avoid giving rise to objection under Articles 34(2)(b) and 41(2) PCT by the inadvertent addition or deletion of subject-matter which extends the content of the application beyond that of the application as filed.
- 7.5 in order to facilitate the examination of the conformity of the amended application with the requirements of Article 34(2)(b) PCT, the applicant is requested to clearly identify the amendments carried out, and to indicate the passages of the application as filed on which these amendments are based (see also Rule 66.8(a) PCT).